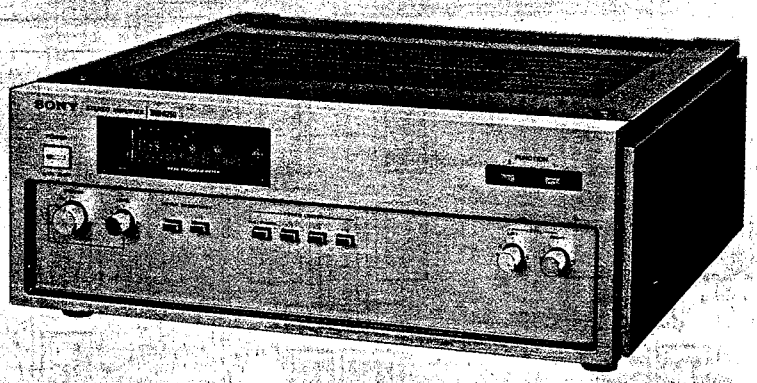
TAN-8250

USA Model



STEREO POWER AMPLIFIER

SPECIFICATIONS

POWER AMP SECTION

Power outputs:

	2 CH	Monaural
Continuous RMS power output: (rated output) (less than 0.2 % THD)	180 W + 180 W/8 Ω 250 W + 250 W/4 Ω at 1 kHz, both channels driven simultaneously	LOW 350 W/4 Ω, 470 W/2 Ω HIGH 380 W/16 Ω, 550 W/8 Ω at 1 kHz
	150 W + 150 W/8 Ω 200 W + 200 W/4 Ω at 20 Hz~20 kHz, both channels driven simultaneously	LOW 300 W/4 Ω, 400 W/2 Ω HIGH 350 W/16 Ω, 500 W/8 Ω at 20 Hz~20 kHz
Dynamic power output: (IHF constant power supply method)	370 W/8 Ω 500 W/4 Ω	LOW 370 W/4 Ω, 500 W/2 Ω HIGH 380 W/16 Ω, 550 W/8 Ω

Power bandwidth: (IHF) 5 Hz~50 kHz with 8 Ω load

Harmonic distortion: 0.1 % at rated output
0.05 % at 1 W output

IM distortion: (60 Hz : 7 kHz = 4:1) 0.1 % at rated output
0.05 % at 1 W output

Frequency response: (at 1 W output) 20 Hz~100 kHz $^{+0}_{-3}$ dB with NORMAL/TEST switch set to NORMAL
DC~100 kHz $^{+0}_{-1}$ dB with NORMAL/TEST switch to TEST

Inputs: Sensitivity: 1.0 V RMS (for rated output)
Impedance: 50 kΩ
(Two pairs of inputs equipped with LEVEL controls)

Outputs: Total impedance should be higher than 4 Ω.
In 2CH mode
minimum speaker impedance is 4 Ω.
In MONO-LOW mode
minimum speaker impedance is 2 Ω.
In MONO-HIGH mode
minimum speaker impedance is 8 Ω.

Residual noise: 1 μW

S/N ratio: 100 dB, weighting network A, short-circuited

Damping factor: 250 (8 Ω, at 1 kHz, at SPEAKER DIRECT terminal)

OPTICAL PEAK PROGRAM METER

Frequency response: 30 Hz~30 kHz $^{+0}_{-3}$ dB

Measuring range: 0~200 W (with METER SENSITIVITY switch set to "x 1/10" ..... 0 W~20 W)

GENERAL

System: Phase-linear dc stereo pure-complementary power amplifier

Power requirements: 120 V ac, 60 Hz

Power consumption: 380 W

AC outlet: 1 unswitched 200 W

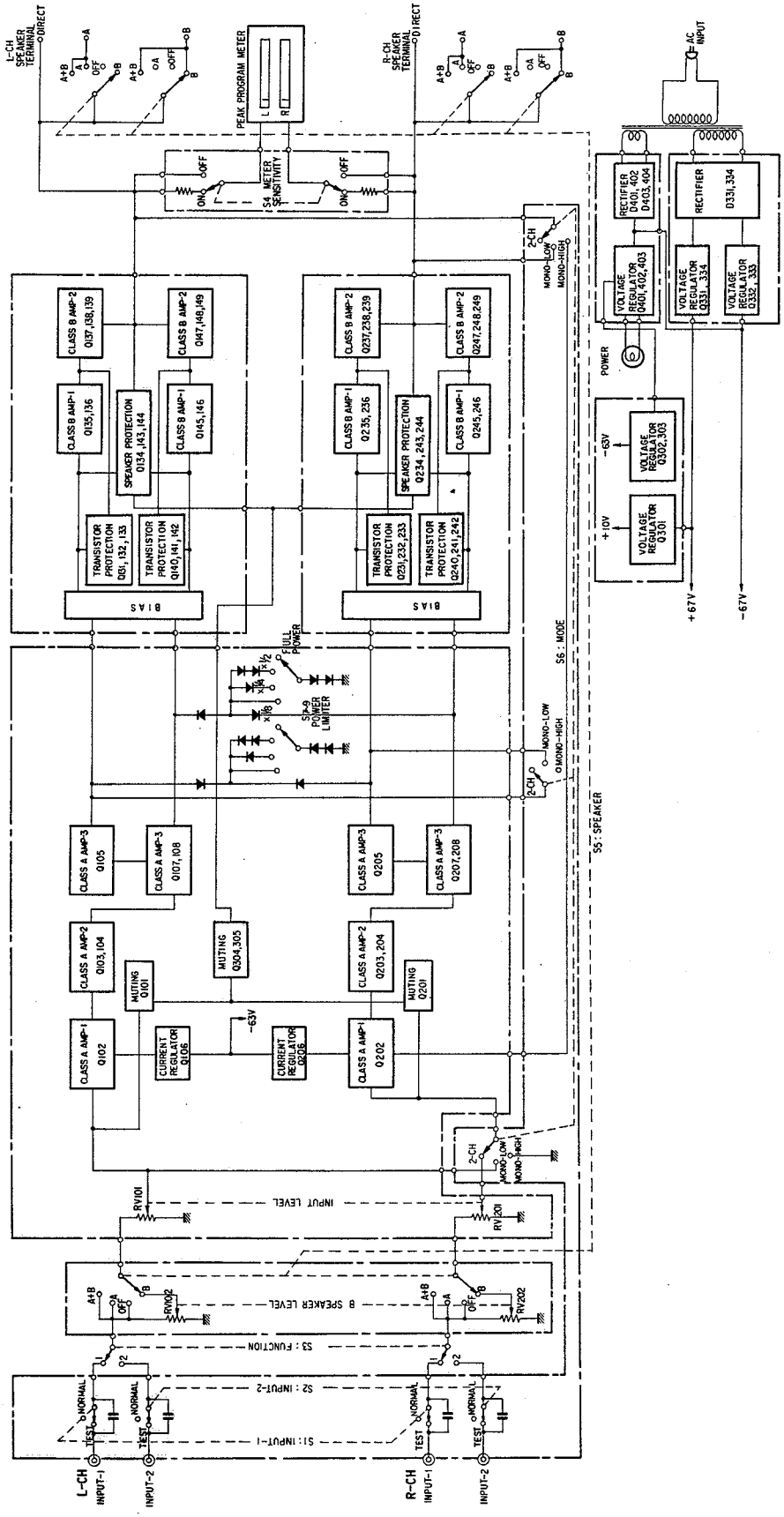
Dimensions: 440 (w) x 170 (h) x 410 (d) mm
17 3/8 (w) x 6 3/4 (h) x 16 1/8 (d) inches

Weight: 23.3 kg (51 lb 6 oz), net
28.4 kg (62 lb 10 oz), in shipping carton

SONY®

SERVICE MANUAL

BLOCK DIAGRAM



SECTION 1
DISASSEMBLY AND REPLACEMENT

Note: All screws are Phillips type (cross recess type), unless otherwise noted.

1-1. FRONT PANEL REMOVAL

1. Remove the upper panel by taking out the four screws.
2. Remove the screws shown in Fig. 1-1, Fig. 1-2 and Fig. 1-3.

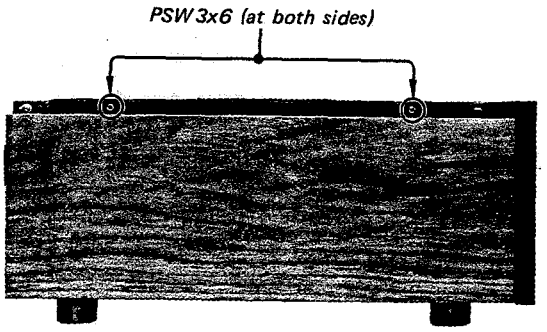


Fig. 1-1. Side panel removal

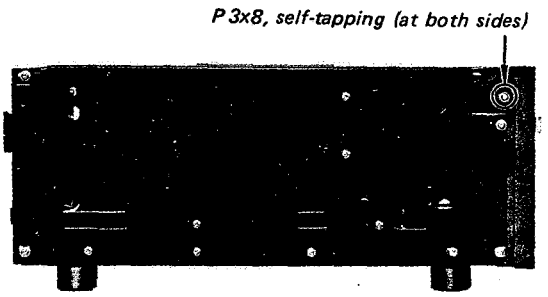


Fig. 1-2. Front panel removal (1)

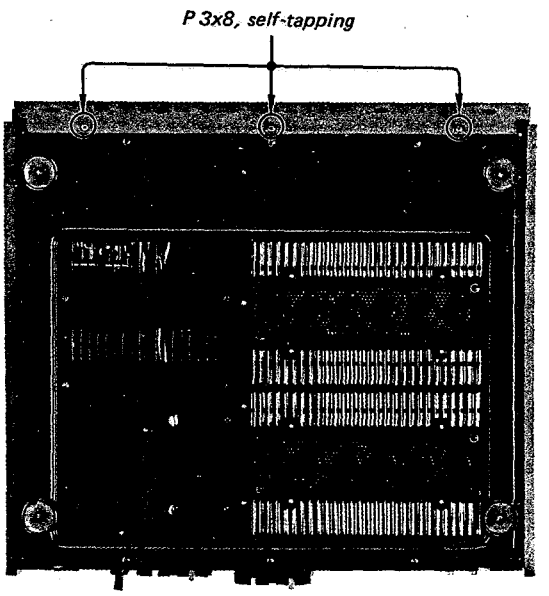


Fig. 1-3. Front panel removal (2)

1-2. FRONT SUBCHASSIS AND REAR PANEL REMOVAL

Remove the screws shown in Fig. 1-4. and Fig. 1-5.

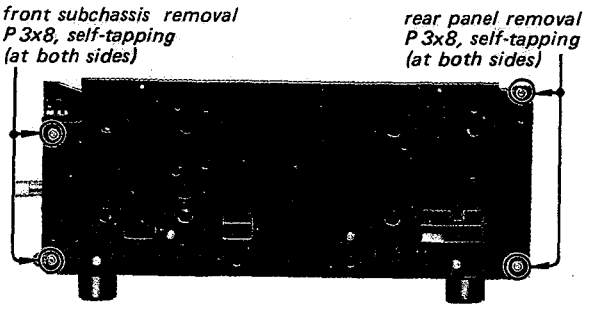


Fig. 1-4. Front subchassis and rear panel removal (1)

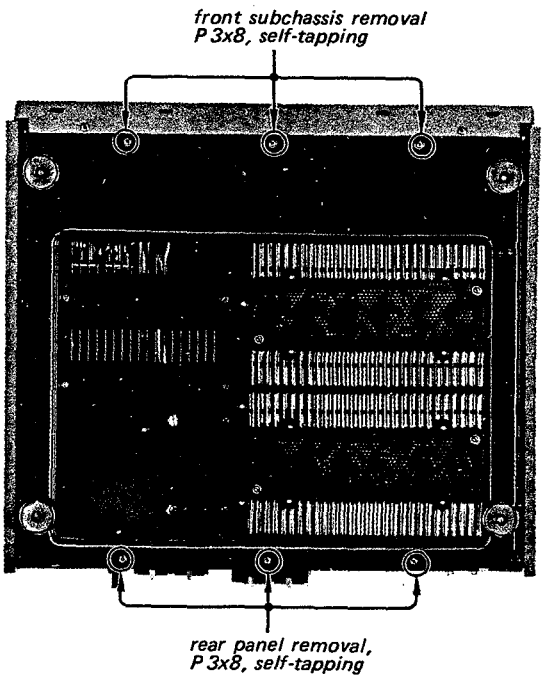


Fig. 1-5. Front subchassis and rear panel removal (2)

1-3. PEAK PROGRAM METER REPLACEMENT

Remove the screws shown in Fig. 1-6 and Fig. 1-7.

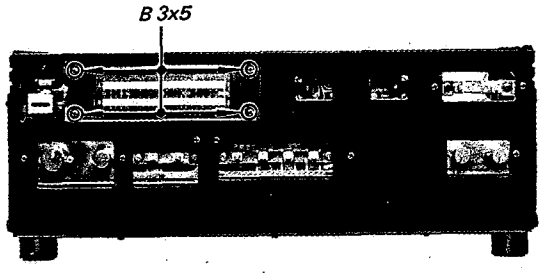


Fig. 1-6. Peak program meter bracket removal

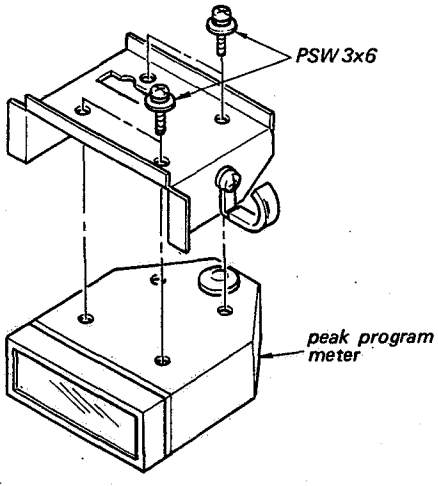


Fig. 1-7. Peak program meter replacement

1-4. CIRCUIT BOARD REMOVAL

Class-B Amp Board Removal

Remove the screws shown in Fig. 1-8 and Fig. 1-9.

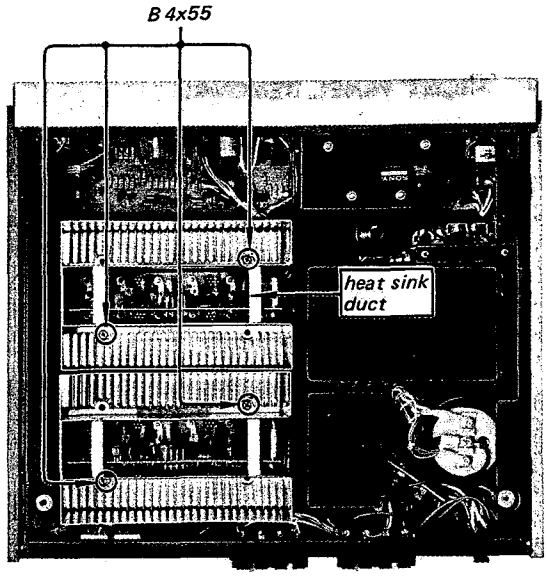


Fig. 1-8. Heat sink duct removal

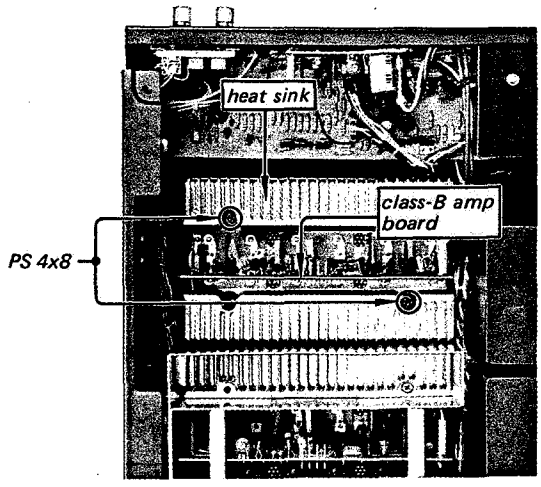


Fig. 1-9. Heat sink and class-B amp board removal

Class-A Amp Board and Meter Board Removal

See Fig. 1-10.

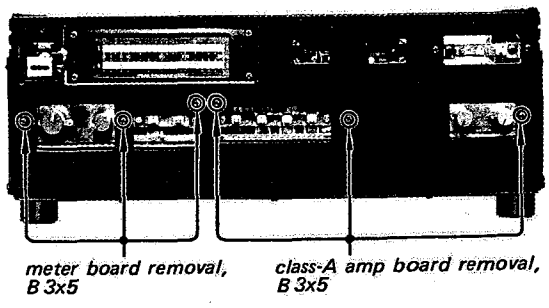


Fig. 1-10. Class-A amp board and meter board removal

Regulator Board Removal

Remove the two nylon rivets shown in Fig. 1-11.

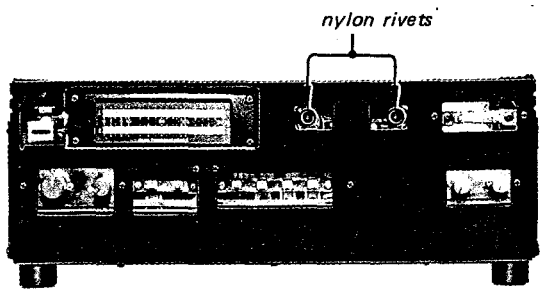


Fig. 1-11. Regulator board removal

Power Supply Board Removal

Remove the two screws shown in Fig. 1-12.

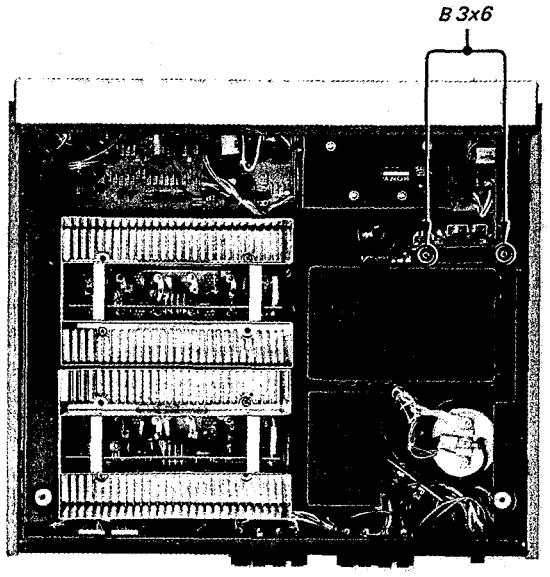


Fig. 1-12. Power supply board removal

Input Board Removal

1. Remove the rear panel as described in Procedure 1-2.
2. Remove the screws and nylon rivets shown in Fig. 1-13.

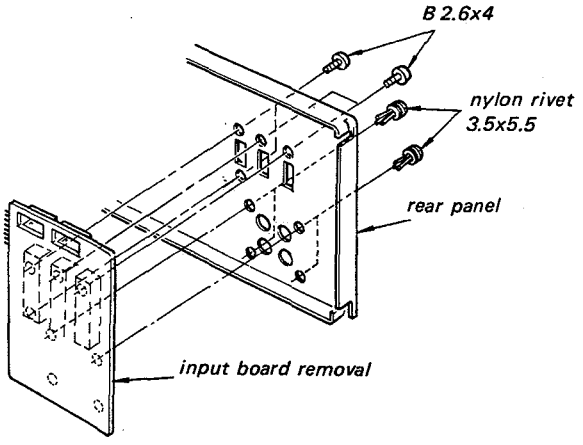


Fig. 1-13. Input board removal

1-5. POWER TRANSISTOR REPLACEMENT

Remove the screws shown in Fig. 1-14 and Fig. 1-15.

Note: When replacing the power transistor, apply a coating of a heat-transferring grease to both sides of the mica insulator as shown in Fig. 1-15. Any excess grease squeezed out when the screws (B 3x12) are tightened should be wiped off with a clean cloth. This prevents it from accumulating conductive dust particles that might eventually cause a short.

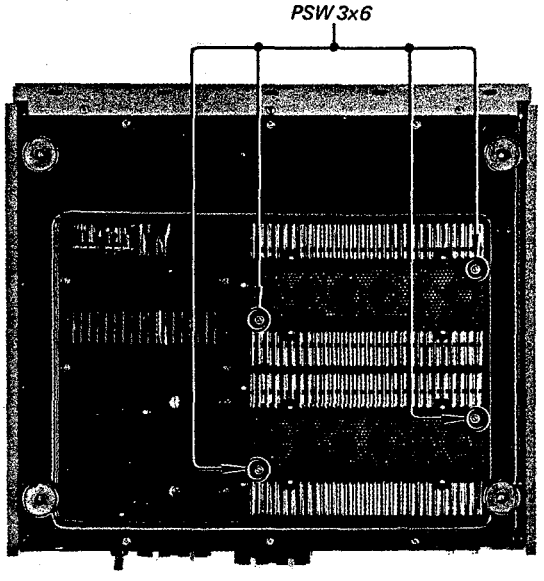


Fig. 1-14. Bottom plate cover removal

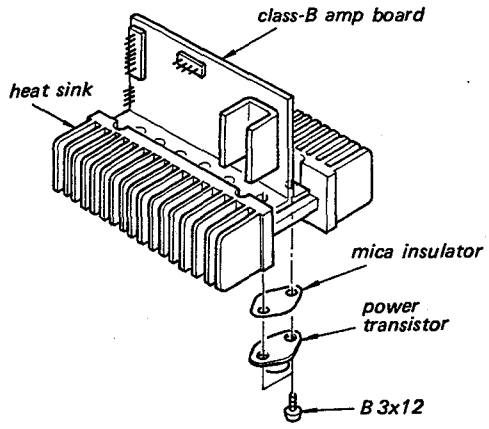


Fig. 1-15. Power transistor replacement

1-6. CHASSIS LAYOUT

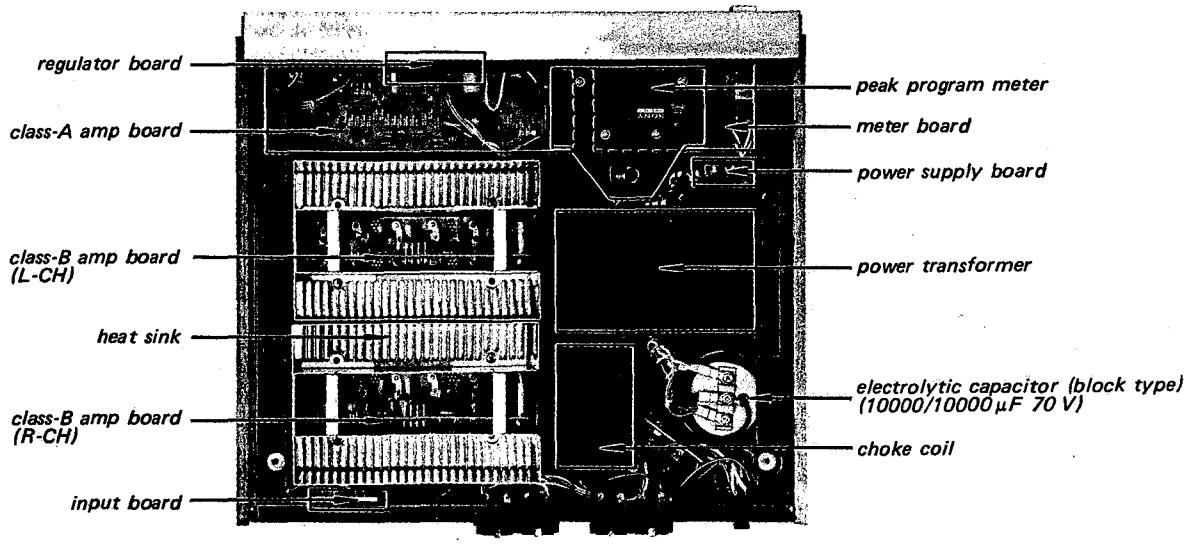


Fig. 1-16. Chassis layout — top view —

SECTION 2
ADJUSTMENTS

Note: Allow about five minutes for warm-up.

2-1. POWER VOLTAGE ADJUSTMENT

Regulator Board

CAUTION

Never short the test terminal pin to ground, because the voltage difference between the each pin and ground is 70～76 V in absolute value.

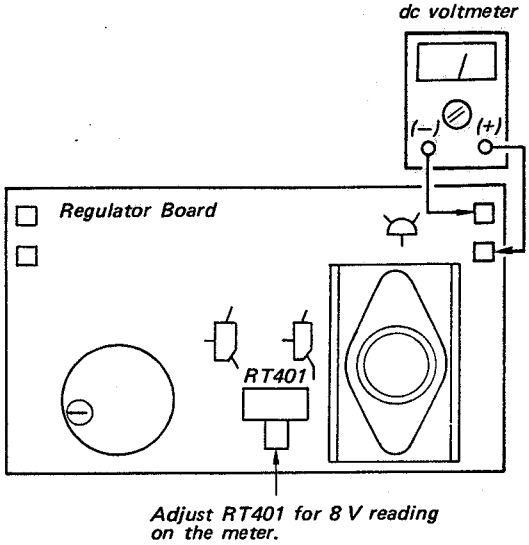


Fig. 2-1.

Class-A Amp Board

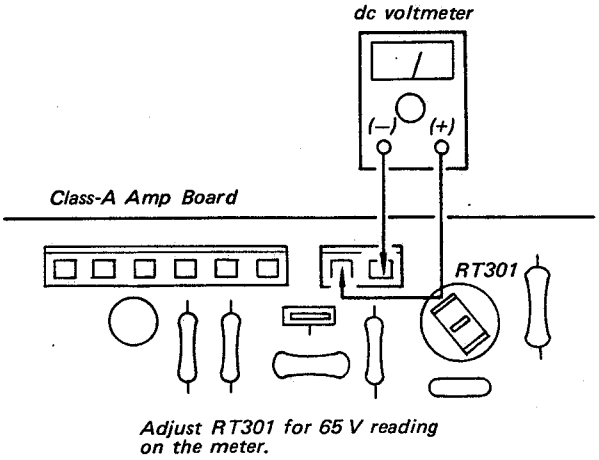


Fig. 2-2.

Note: If this adjustment has not been made correctly, enough output will not be obtained.

Power Supply Board

Note: Always connect the 8 Ω load across the SPEAKER OUT "A" and feed a 1 kHz signal to TAN-8250 during the adjustment.

Test setup:

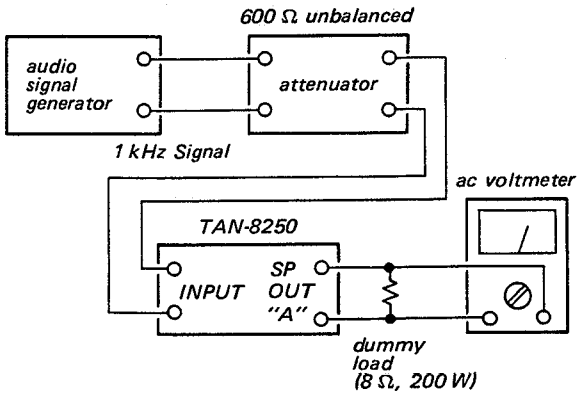


Fig. 2-3.

Preparation

1. Set the TAN-8250 switches and control as follows:

   SPEAKER switch ..... A
   POWER LIMITER switch ... FULL POWER
   INPUT switch ..... NORMAL
   MODE switch 2CH
   LEVEL control ..... fully clockwise

2. Feed a 1 kHz signal to TAN-8250, and adjust the attenuator for 50 W (20.0 V) on the meter.
3. Connect the dc voltmeter across terminal pins of capacitor as shown in Fig. 2-4.
4. With the 1 kHz signal fed, adjust RT331 (See Fig. 2-5.) for 65 V reading (See Fig. 2-4.) on the meter, respectively.

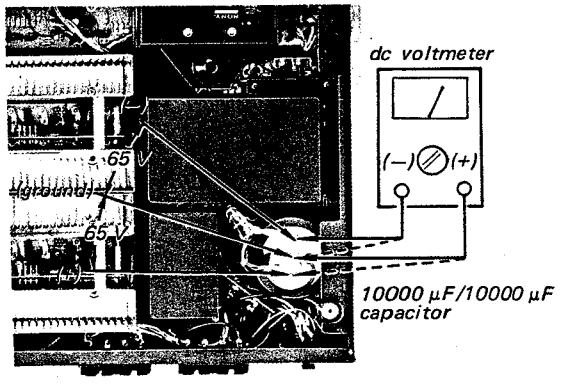


Fig. 2-4.

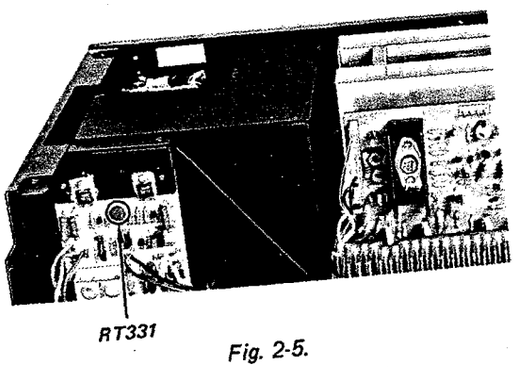


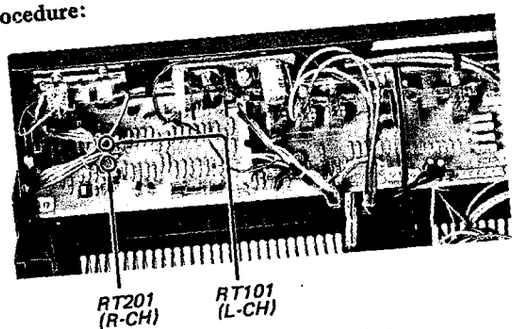
Fig. 2-5.

2-2. DC BALANCE ADJUSTMENT

Preparation:

1. Set the TAN-8250 switches as follows:
   SPEAKER switch ..... A
   MODE switch 2CH
2. Connect the dc voltmeter across the SPEAKER OUT "A".

Procedure:

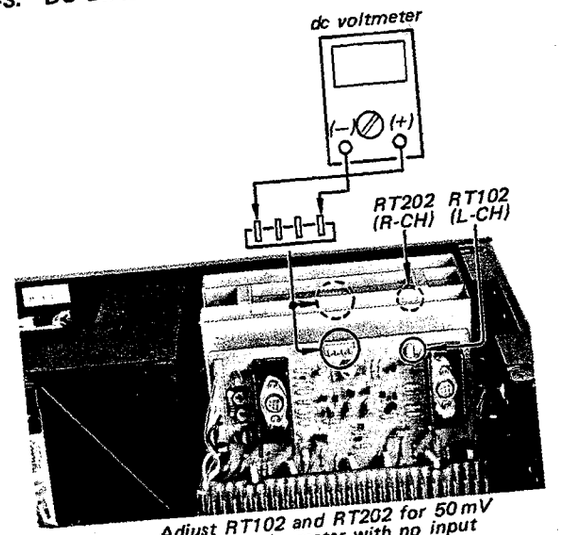


Adjust RT101 and RT201 for 0 V reading on the meter.

Fig. 2-6.

Note: The dc balance and dc bias adjustments should be alternately repeated two or three times.

2-3. DC BIAS ADJUSTMENT



Adjust RT102 and RT202 for 50 mV reading on the meter with no input signal.

Fig. 2-7.

Note: The dc balance and dc bias adjustments should be alternately repeated two or three times.

2-4. PEAK PROGRAM METER ADJUSTMENT AND CHECK

Test setup:

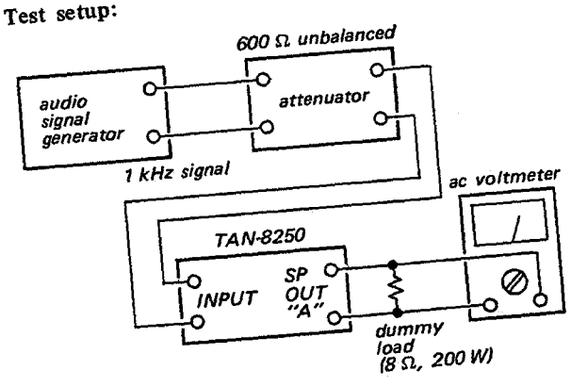


Fig. 2-8.

Preparation:

Set the TAN-8250 switches as follows:

SPEAKER switch ..... A
POWER LIMITER switch ... FULL POWER
METER SENSITIVITY
switch x1
MODE switch 2CH
INPUT switch ..... NORMAL

Procedure:

1. Feed a 1 kHz signal to INPUT jack and adjust the attenuator for 100 W (28.3 V) reading on the ac voltmeter.
2. Adjust RT181 and RT281 (See Fig. 2-9.) so that the peak program meter reads 100 W.

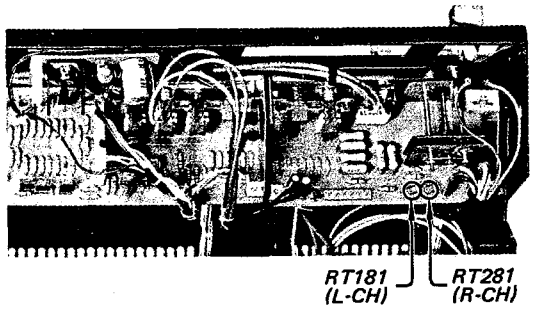


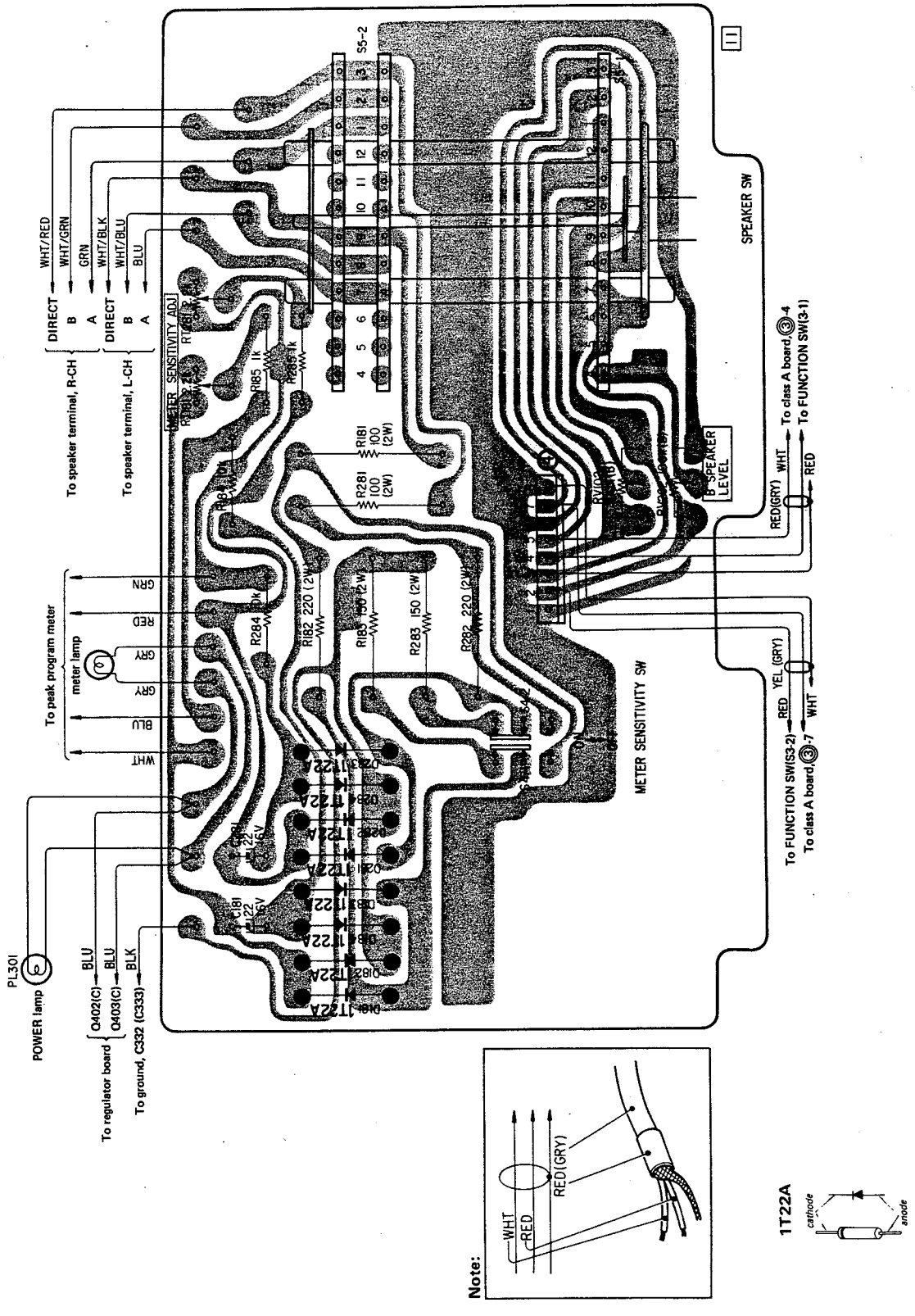
Fig. 2-9.

3. Decrease the output of attenuator 10 dB, and confirm that the peak program meter reads 10 W.
4. Change the METER SENSITIVITY switch to "x1/10", and confirm that the peak program meter reads 100 W.
5. Decrease the output of attenuator 10 dB, and confirm that the peak program meter reads 10 W.
6. Change the METER SENSITIVITY switch to "x1", and confirm that the peak program meter reads 1 W.

SECTION 3
DIAGRAMS

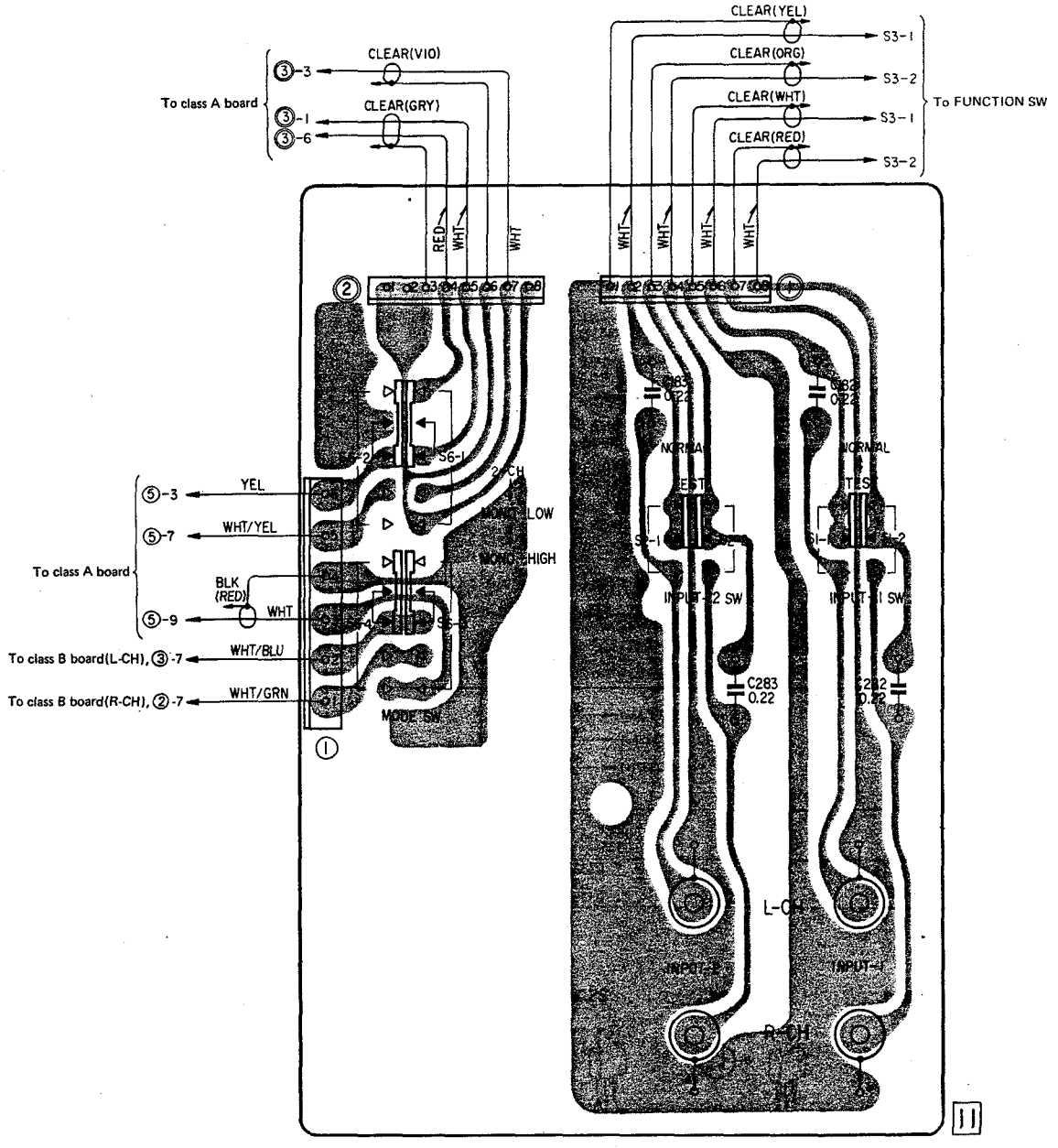
3-1. MOUNTING DIAGRAM – Meter Board –

– Conductor Side –

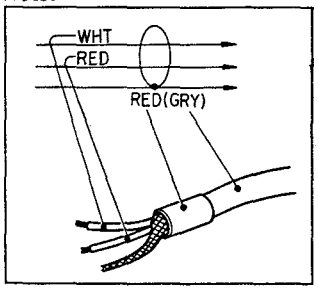


3-2. MOUNTING DIAGRAM – Input Board –

– Conductor Side –

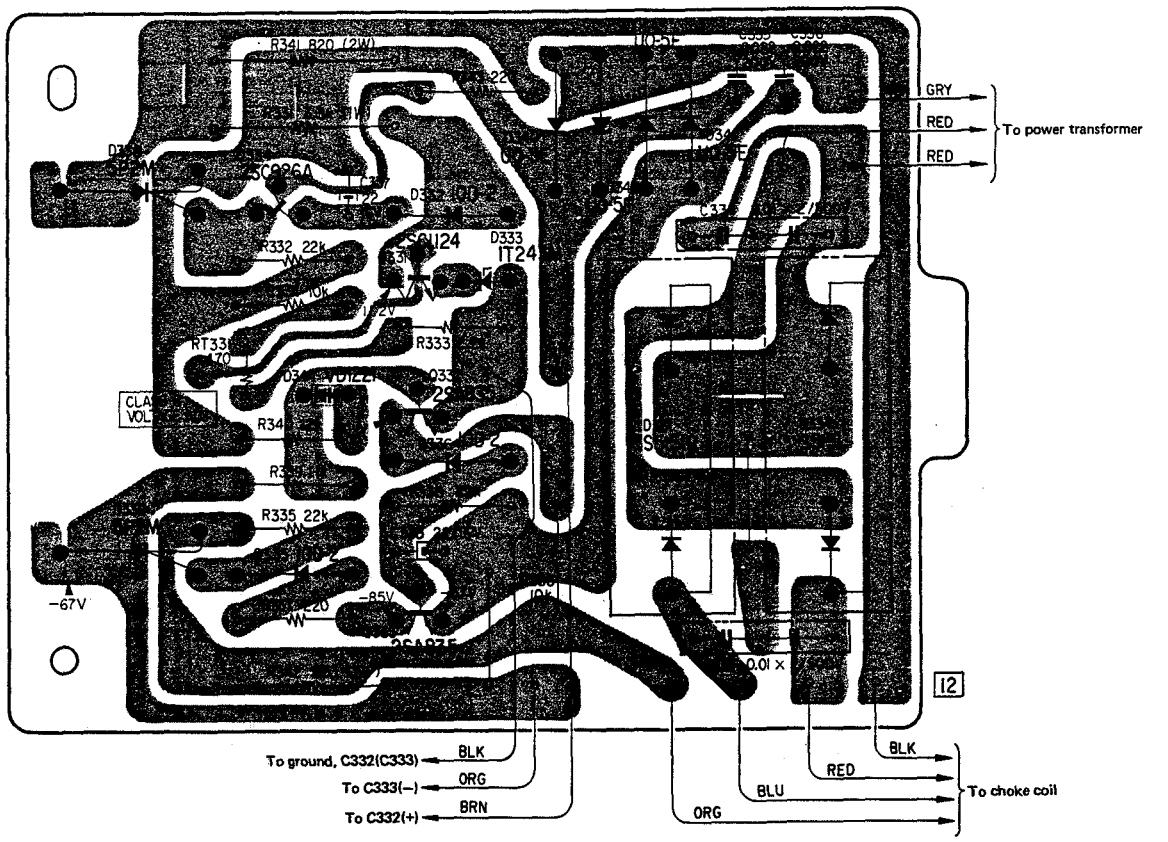


Note:



3-3. MOUNTING DIAGRAM – Power Supply Board –

– Conductor Side –

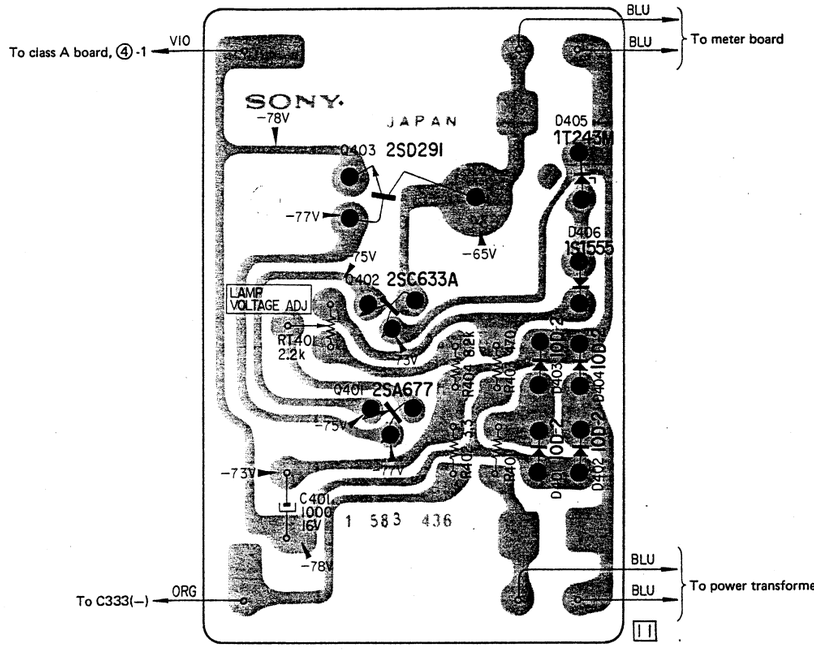


Parts Location

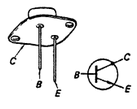
| | | |

3-4. MOUNTING DIAGRAM — Regulator Board —

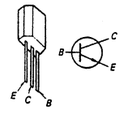
— Conductor Side —



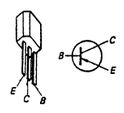
2SD291



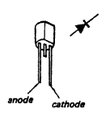
2SC633A



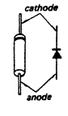
2SA677



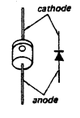
1T243M



1S1555



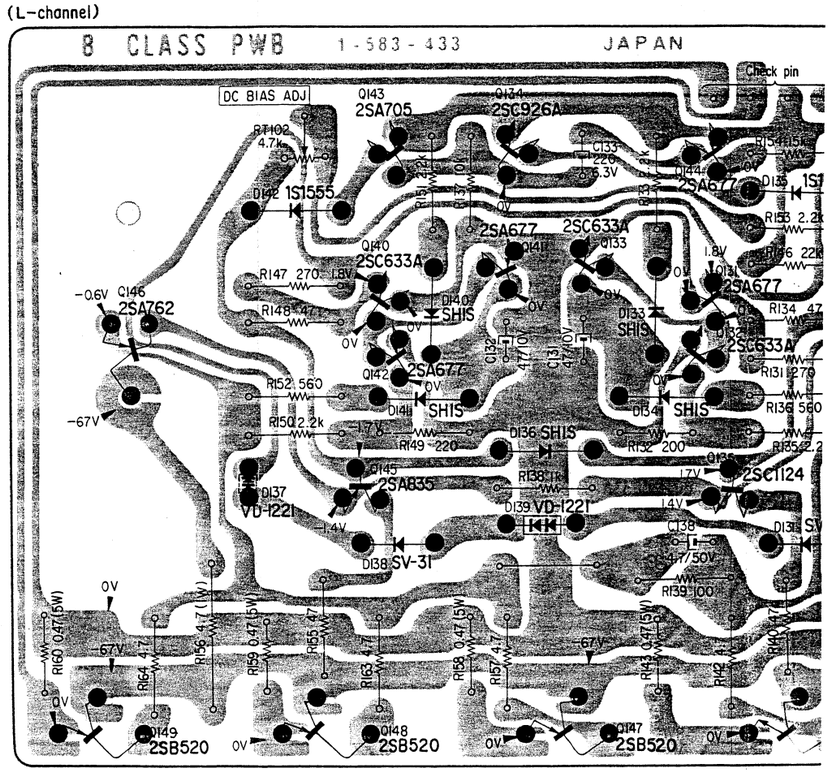
10D-2



3-5. MOUNTING DIAGRAM — Class-B Amp Board —

— Conductor Side —

(L-channel)



Parts Location

| | | |

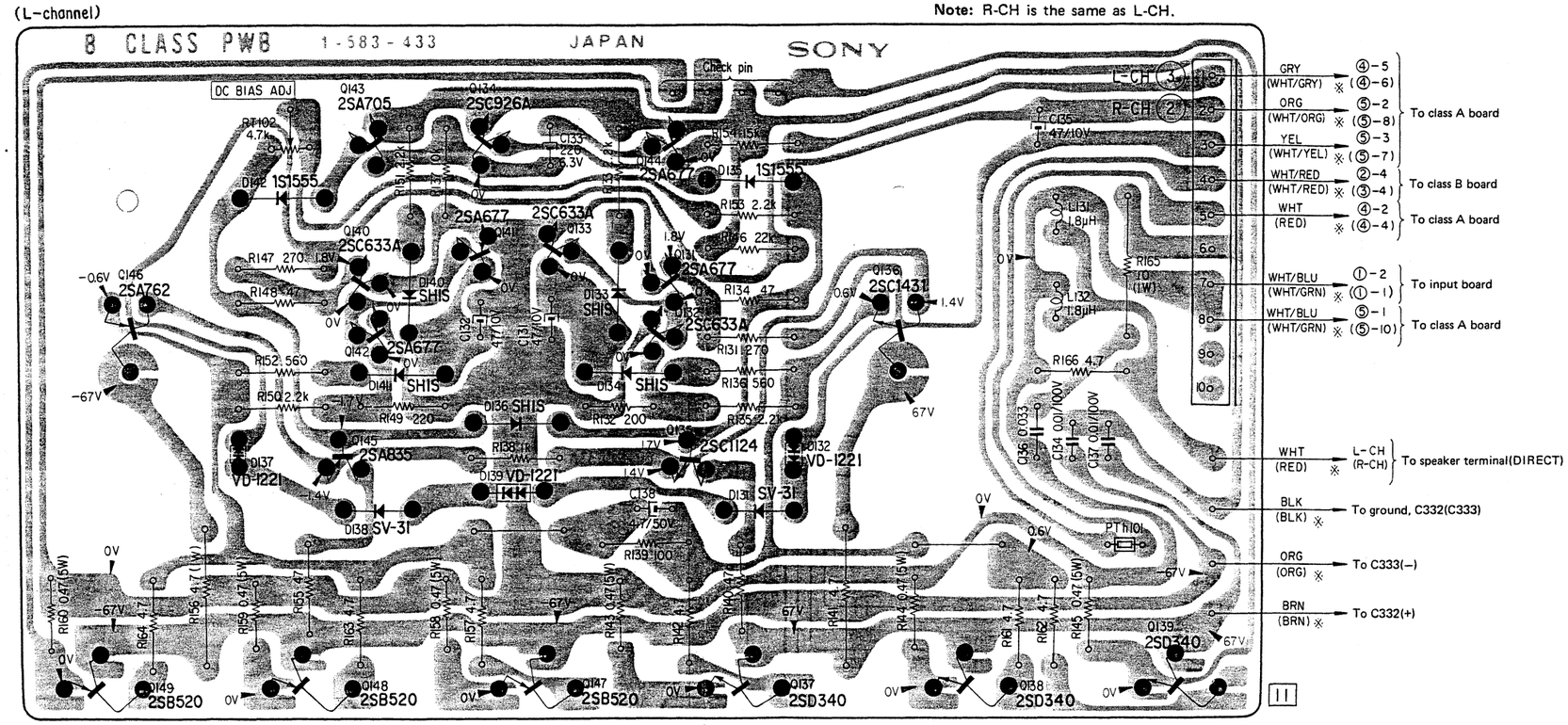
TAN-8250

3-5. MOUNTING DIAGRAM — Class-B Amp Board —

— Conductor Side —

(L-channel)

Note: R-CH is the same as L-CH.



Parts Location

Q	Q146 Q143 Q140 Q142 Q145 Q134 Q141 Q133 Q144 Q131 Q132 Q135 Q136 Q149 Q148 Q147 Q137 Q138 Q139
D	D142 D140 D141 D137 D138 D136 D139 D133 D134 D135 D132 D131

2SC1431

2SC1124

2SD340

2SB520

2SA762

2SA835

2SA677

2SC633A

2SA705

2SC926A

VD-1221

SV-31

SH-1S

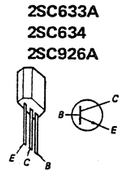
1S1555

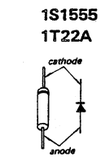
Note: The reference numbers in R-channel start from 200's.

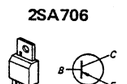
※ mark shows the lead wire of R channel.

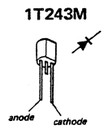
3-6. MOUNTING DIAGRAM — Class-A Amp Board —

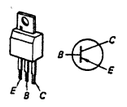
— Conductor Side —

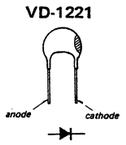


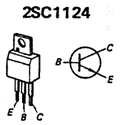


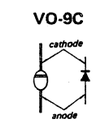


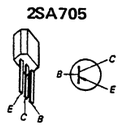


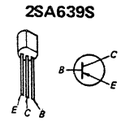


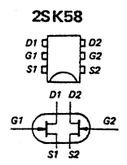


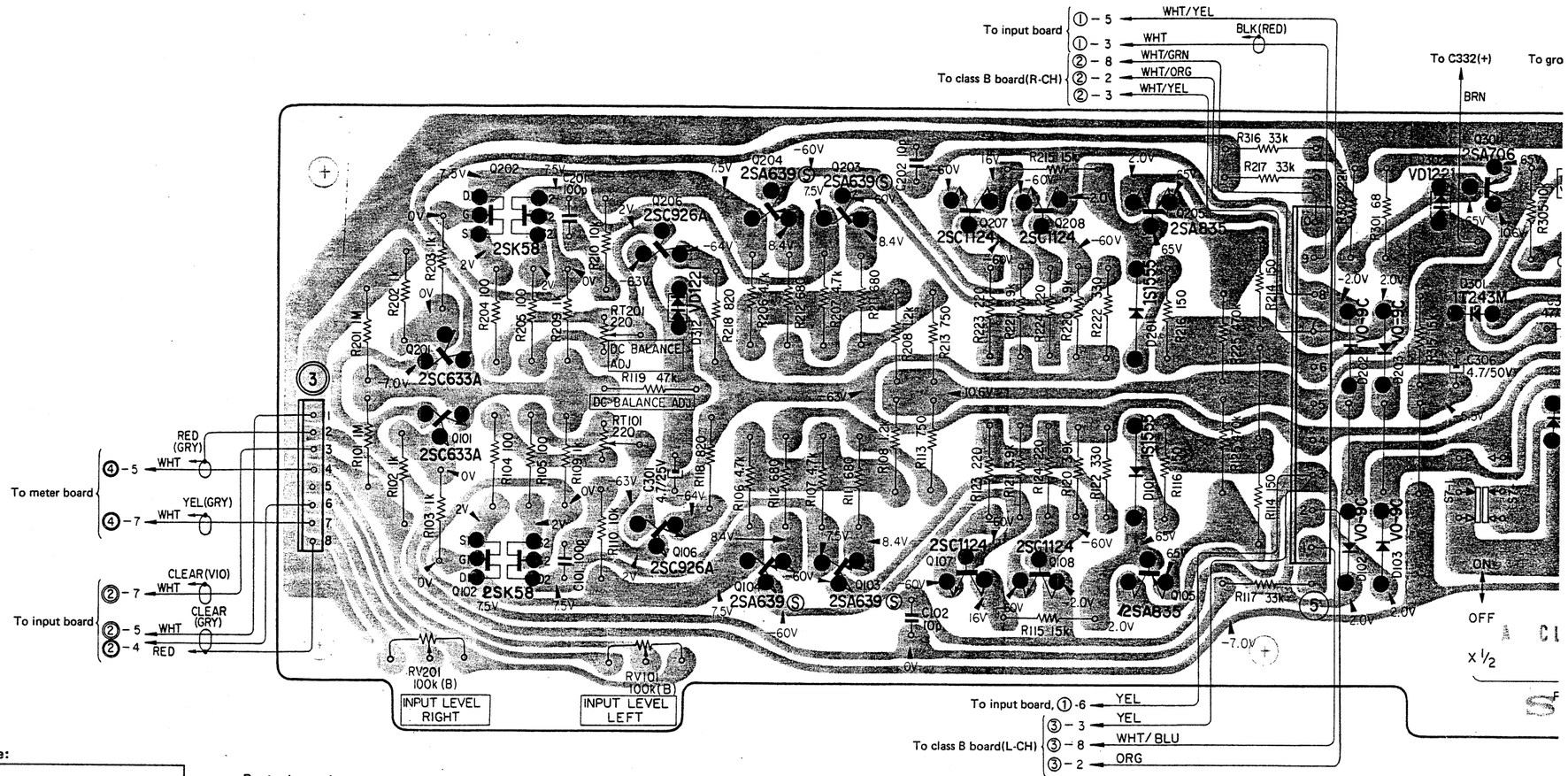




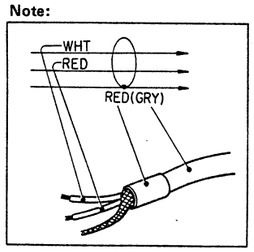






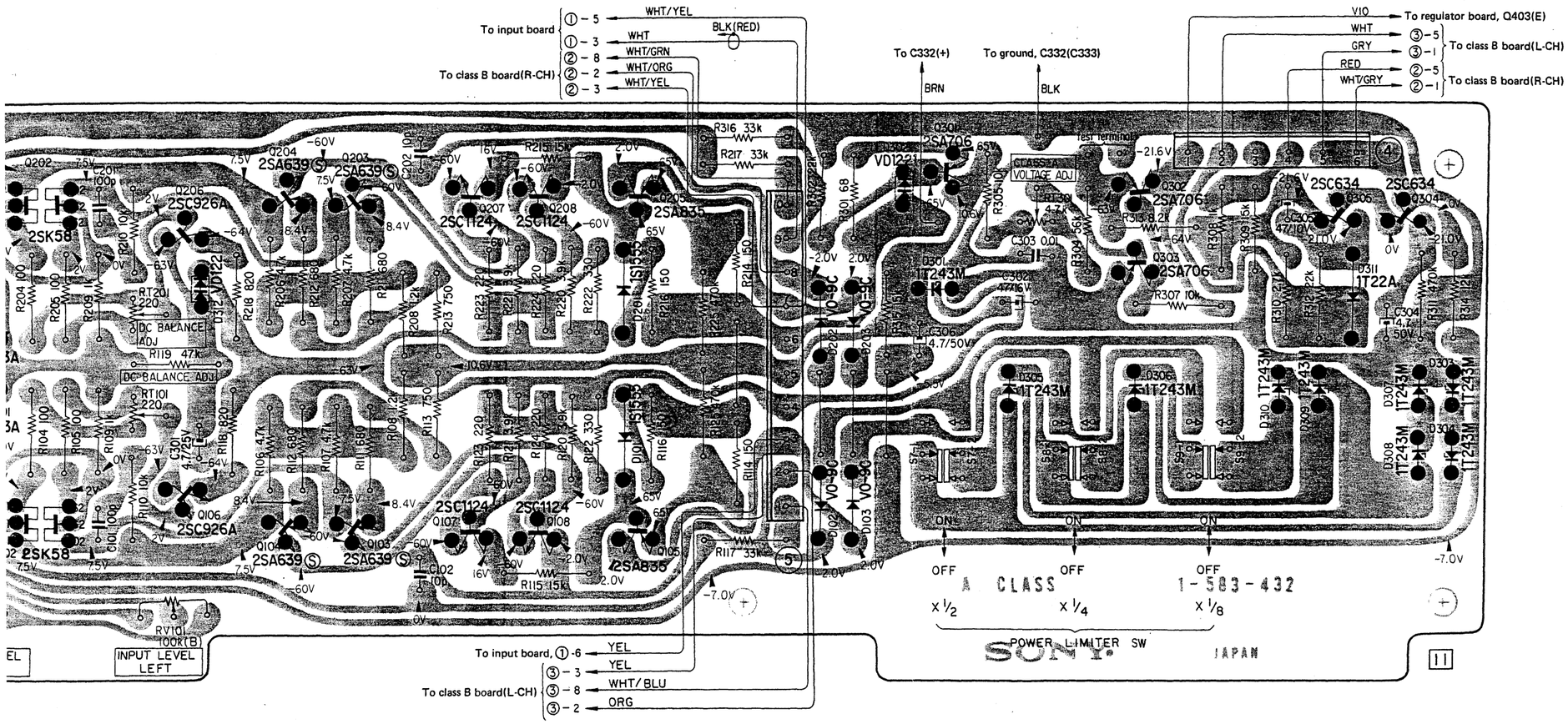


Note:



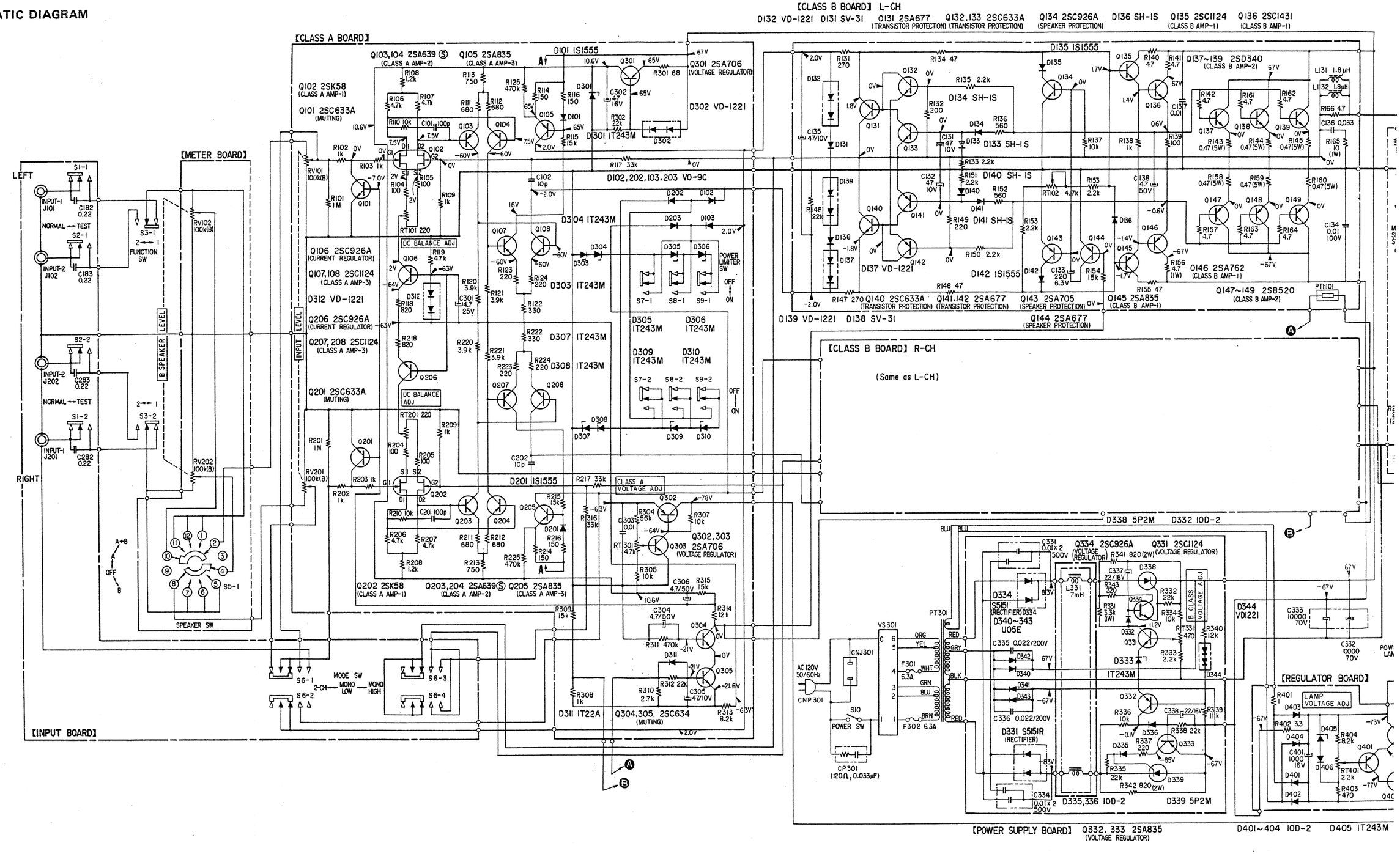
Parts Location

| | | |


To input board ① – 5 WHT/YEL
① – 3 WHT
BLK(RED)
To class B board(R-CH) ② – 8 WHT/GRN
② – 2 WHT/ORG
② – 3 WHT/YEL
To C332(+)
To ground, C332(C333)
BRN
BLK
VIO To regulator board, Q403(E)
WHT ③ – 5
GRY ③ – 1
To class B board(L-CH)
RED ② – 5
WHT/GRY ② – 1
To class B board(R-CH)
Test Terminal
CLASS A VOLTAGE ADJ
DC BALANCE ADJ
INPUT LEVEL LEFT
POWER LIMITER SW
OFF
A CLASS
1-583-432
x 1/2
x 1/4
x 1/8
SONY
JAPAN
To input board, ① -6 YEL
③ – 3 YEL
To class B board(L-CH) ③ – 8 WHT/BLU
③ – 2 ORG

| | | |

3-7. SCHEMATIC DIAGRAM


[CLASS B BOARD] L-CH
D132 VD-1221 D131 SV-31 Q131 2SA677 (TRANSISTOR PROTECTION) Q132,133 2SC633A (TRANSISTOR PROTECTION) Q134 2SC926A (SPEAKER PROTECTION) D136 SH-1S Q135 2SC1124 (CLASS B AMP-1) Q136 2SC1431 (CLASS B AMP-1)
[CLASS A BOARD]
[METER BOARD]
LEFT
RIGHT
[INPUT BOARD]
[CLASS B BOARD] R-CH
(Same as L-CH)
[POWER SUPPLY BOARD] Q332, 333 2SA835 (VOLTAGE REGULATOR)
[REGULATOR BOARD]
D102, 202, 103, 203 V0-9C
D139 VD-1221 D138 SV-31
Q144 2SA677 (SPEAKER PROTECTION)
D137 VD-1221
D142 1S1555
D344 VD1221
D339 5P2M
D338 5P2M D332 10D-2
D335, 336 10D-2
D401~404 10D-2
D405 IT243M
D311 IT22A
Q304, 305 2SC634 (MUTING)
Q302, 303 2SA706 (VOLTAGE REGULATOR)
Q303 2SA706 (VOLTAGE REGULATOR)
D301 IT243M
D302 VD-1221
D101 1S1555
Q301 2SA706 (VOLTAGE REGULATOR)
Q102 2SK58 (CLASS A AMP-1)
Q101 2SC633A (MUTING)
Q103,104 2SA639 (S) (CLASS A AMP-2)
Q105 2SA835 (CLASS A AMP-3)
Q106 2SC926A (CURRENT REGULATOR)
Q107, 108 2SC1124 (CLASS A AMP-3)
D312 VD-1221
Q206 2SC926A (CURRENT REGULATOR)
Q207, 208 2SC1124 (CLASS A AMP-3)
Q201 2SC633A (MUTING)
Q202 2SK58 (CLASS A AMP-1)
Q203, 204 2SA639 (S) Q205 2SA835 (CLASS A AMP-2) (CLASS A AMP-3)
D303 IT243M
D304 IT243M
D305 IT243M
D306 IT243M
D307 IT243M
D308 IT243M
D309 IT243M
D310 IT243M
D201 1S1555
D202 D102
D203 D103
Q140 2SC633A (TRANSISTOR PROTECTION)
Q141, 142 2SA677 (TRANSISTOR PROTECTION)
Q143 2SA705 (SPEAKER PROTECTION)
Q145 2SA835 (CLASS B AMP-1)
Q146 2SA762 (CLASS B AMP-1)
Q147~149 2SB520 (CLASS B AMP-2)
D135 1S1555
D134 SH-1S
D133 SH-1S
D140 SH-1S
D141 SH-1S
D136
D137
D138
D139
D140
D141
D142
Q147
Q148
Q149
Q201
Q202
Q203
Q204
Q205
Q206
Q207
Q208
Q301
Q302
Q303
Q304
Q305
D201
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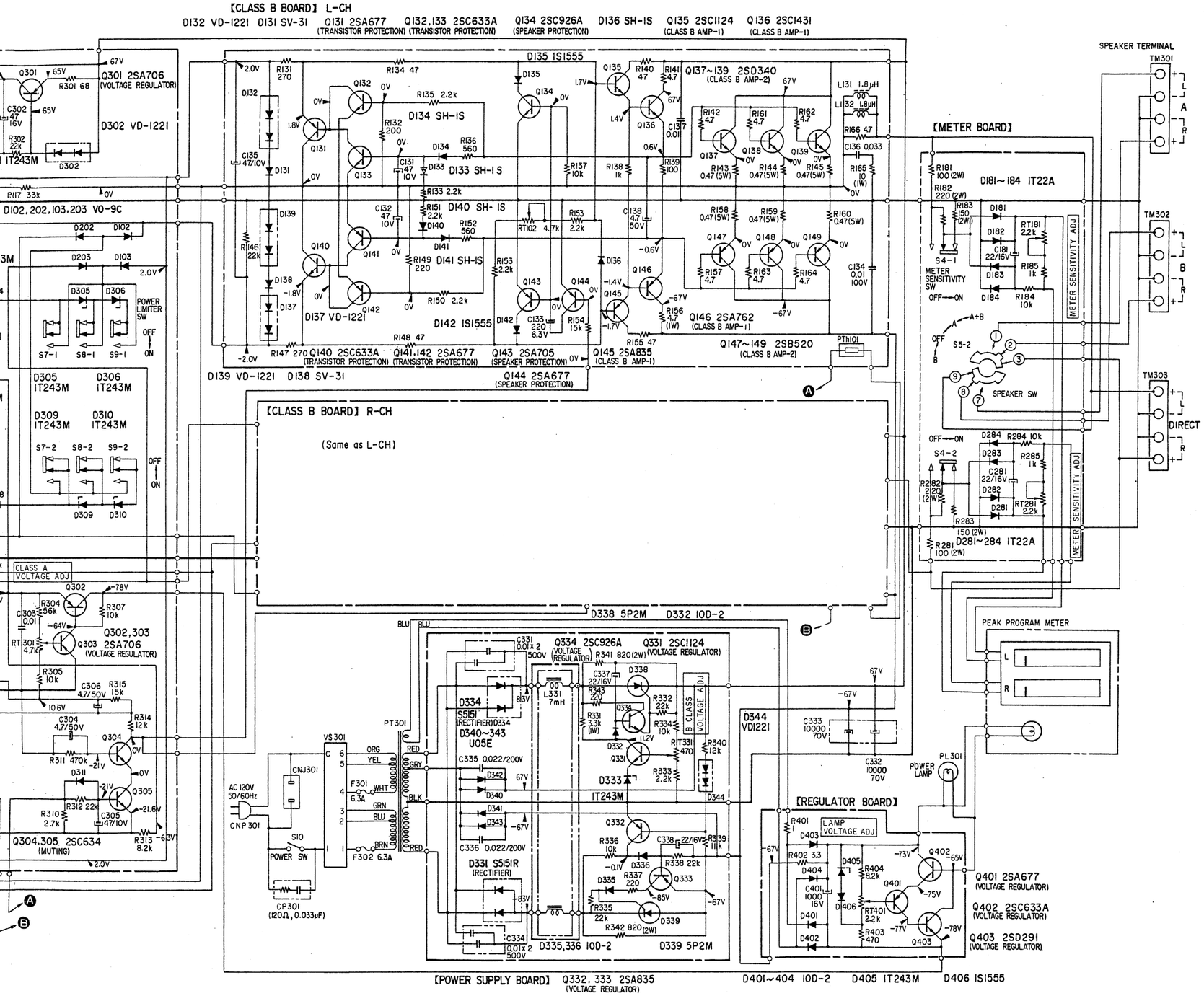
TAN-8250



Ref. No.	Description	Position
S1	INPUT-1 SW (NORMAL-TEST)	NORMAL
S2	INPUT-2 SW (NORMAL-TEST)	NORMAL
S3	FUNCTION SW (INPUT-1 – INPUT-2)	INPUT-1
S4	METER SENSITIVITY SW	ON
S5	SPEAKER SW (A+B-A-OFF-B)	B
S6	MODE SW (2-CH-MONO LOW-MONO HIGH)	2-CH
S7	POWER LIMITER (1/8) SW	OFF
S8	POWER LIMITER (1/4) SW	OFF
S9	POWER LIMITER (1/2) SW	OFF
S10	POWER SW	OFF

Note:

All resistance values are in ohms. k = 1,000 M = 1,000 k

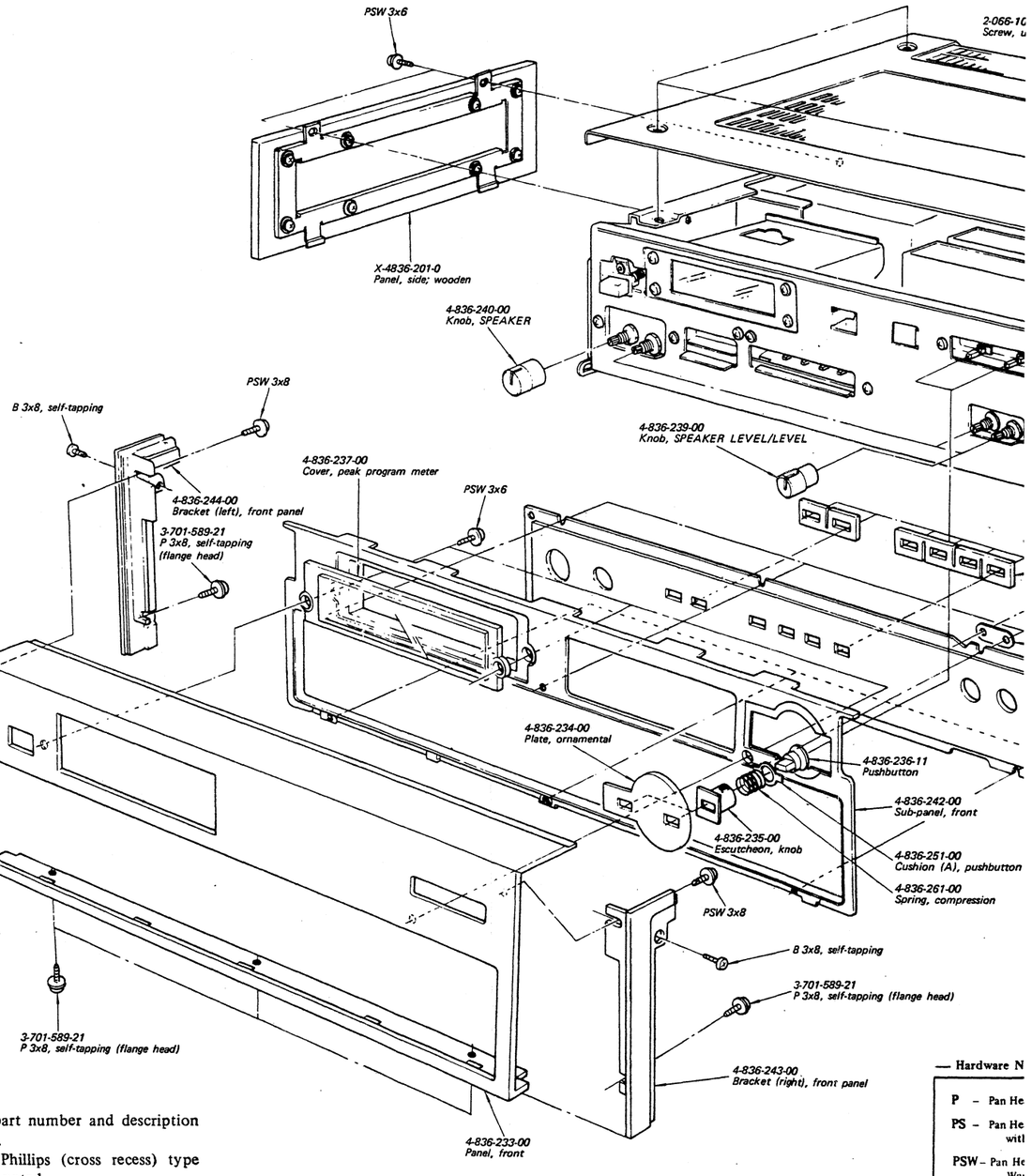
All capacitance values are in μF except as indicated with p, which means μμF.

All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.

Voltage variations may be noted because of normal production tolerances.

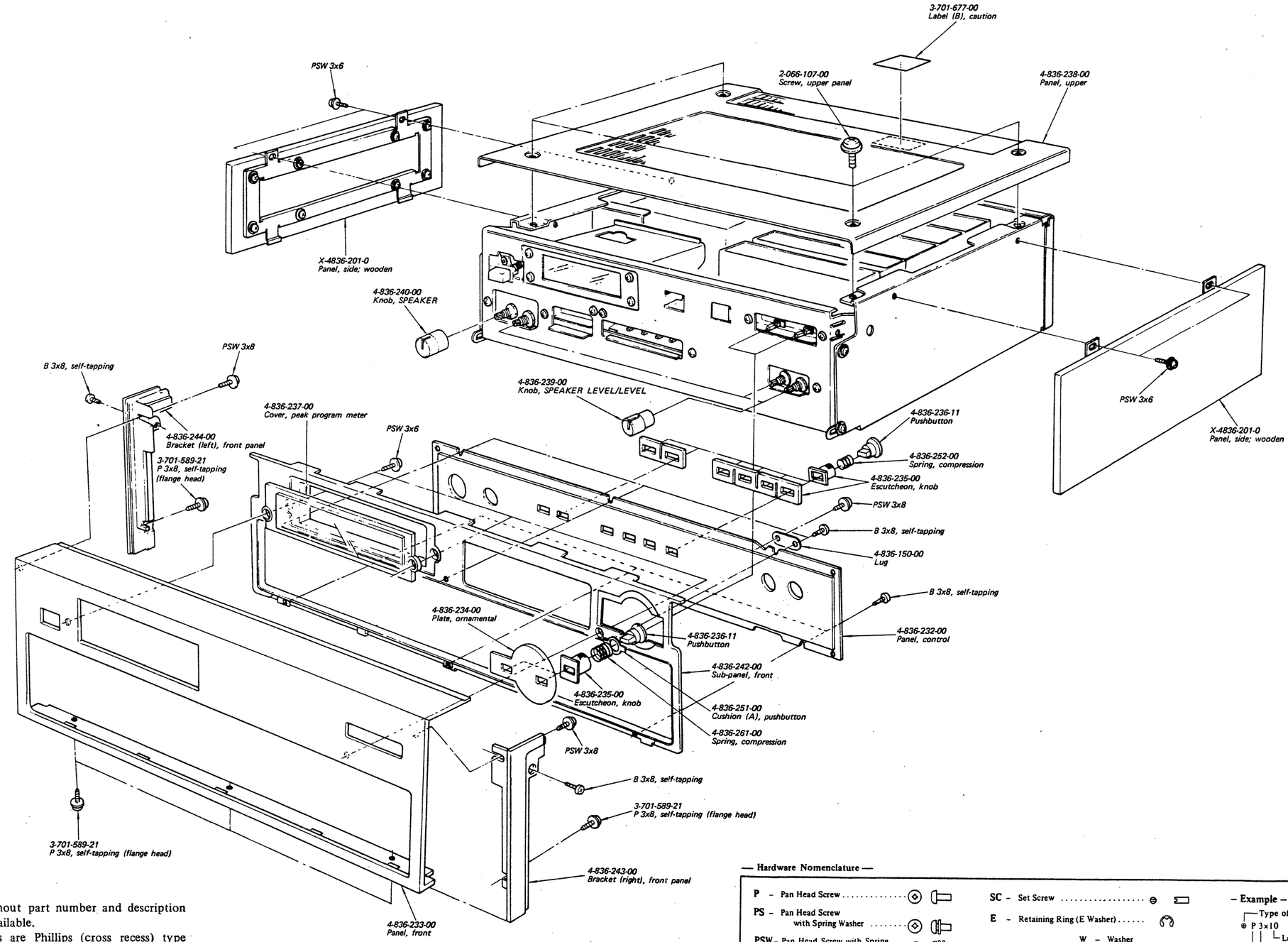
MEMO

SECTION 4
EXPLODED VIEWS



Note: ○ Items without part number and description are not available.
○ All screws are Phillips (cross recess) type unless otherwise noted.
(–) = slotted head

SECTION 4
EXPLODED VIEWS

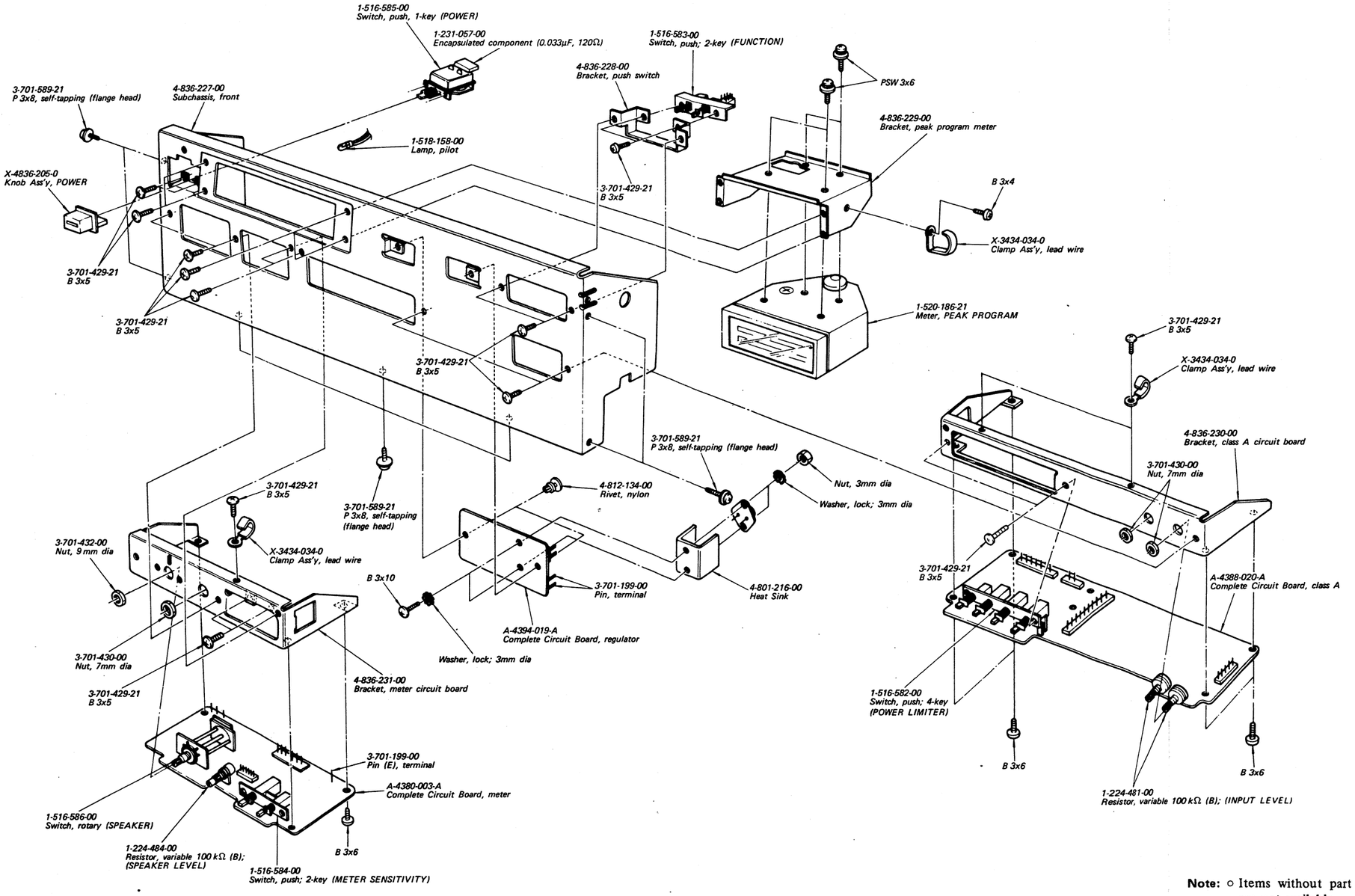


Note: ○ Items without part number and description are not available.
○ All screws are Phillips (cross recess) type unless otherwise noted.
(-) = slotted head

— Hardware Nomenclature —

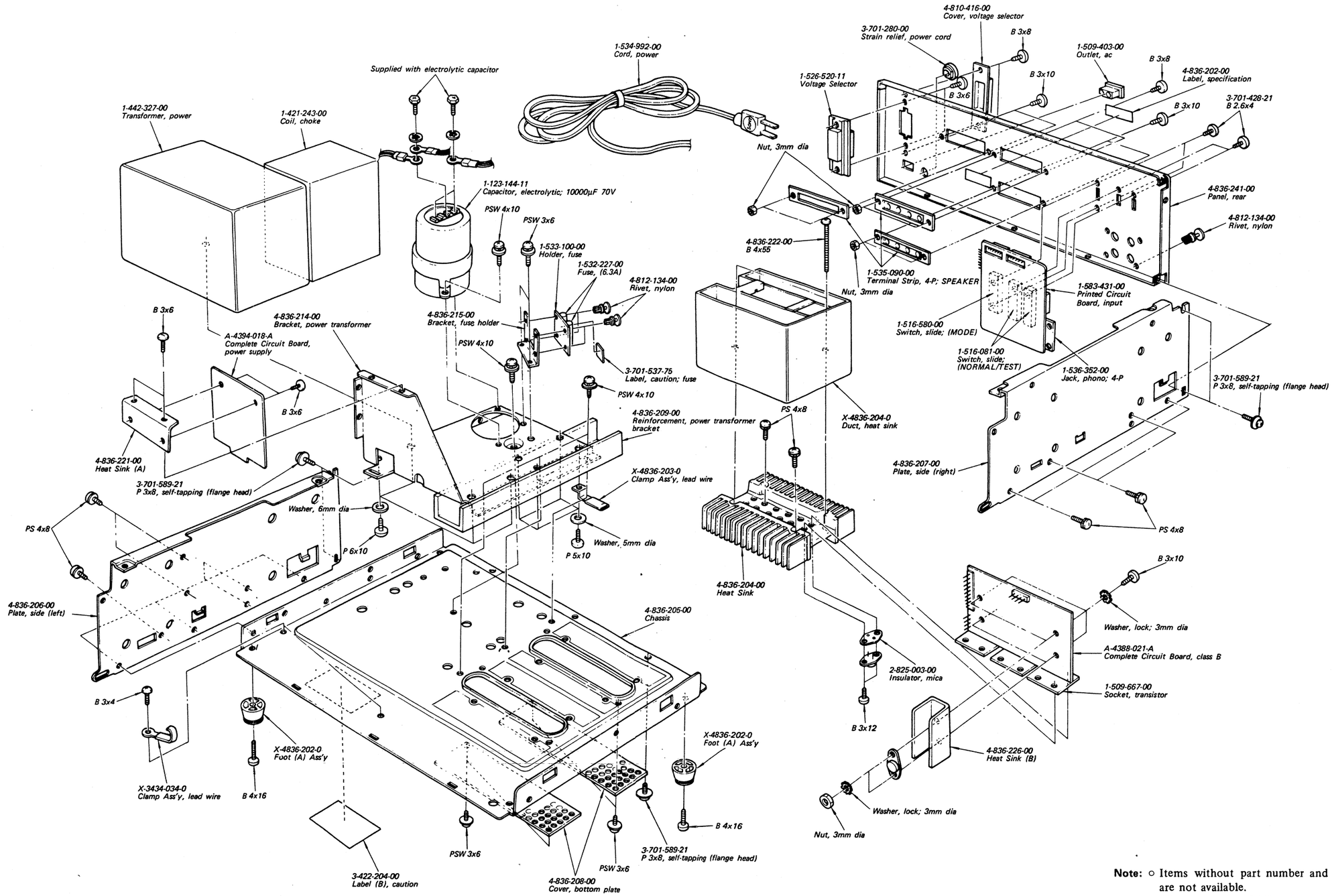
P – Pan Head Screw	SC – Set Screw	– Example –	
PS – Pan Head Screw with Spring Washer	E – Retaining Ring (E Washer)	Type of Slot ⊕ P 3x10	Length in mm (L) / Diameter in mm (D) / Type of Head
PSW – Pan Head Screw with Spring Washer and Washer	W – Washer SW – Spring Washer LW – Lock Washer N – Nut		
B – Binding Head Screw			

(2)



Note: ○ Items without part number and description are not available.
○ All screws are Phillips (cross recess) type unless otherwise noted.
(–) = slotted head

(3)



Note: ○ Items without part number and description are not available.
○ All screws are Phillips (cross recess) type unless otherwise noted.
(–) = slotted head

SECTION 5
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	CIRCUIT BOARDS	
	A-4380-003-A	Meter, complete
	A-4388-020-A	A Class, complete
	A-4388-021-A	B Class, complete
	A-4394-018-A	Power Supply, complete
	A-4394-019-A	Regulator, complete
	1-583-431-00	Input
	SEMICONDUCTORS	
Q101(Q201)		Transistor 2SC633A
Q102(Q202)		FET 2SK58
Q103(Q203)		Transistor 2SA639S
Q104(Q204)		Transistor 2SA639S
Q105(Q205)		Transistor 2SA835
Q106(Q206)		Transistor 2SC926A
Q107(Q207)		Transistor 2SC1124
Q108(Q208)		Transistor 2SC1124
Q131(Q231)		Transistor 2SA677
Q132(Q232)		Transistor 2SC633A
Q133(Q233)		Transistor 2SC633A
Q134(Q234)		Transistor 2SC926A
Q135(Q235)		Transistor 2SC1124
Q136(Q236)		Transistor 2SC1431
Q137~Q139 (Q237~Q239)		Transistor 2SD340
Q140(Q240)		Transistor 2SC633A
Q141(Q241)		Transistor 2SA677
Q142(Q242)		Transistor 2SA677
Q143(Q243)		Transistor 2SA705
Q144(Q244)		Transistor 2SA677
Q145(Q245)		Transistor 2SA835
Q146(Q246)		Transistor 2SA762
Q147~Q149 (Q247~Q249)		Transistor 2SB520
Q301~Q303		Transistor 2SA706
Q304~Q305		Transistor 2SC634A

Ref. No.	Part No.	Description
Q331		Transistor 2SC1124
Q332,Q333		Transistor 2SA835
Q334		Transistor 2SC926A
Q401		Transistor 2SA677
Q402		Transistor 2SC633A
Q403		Transistor 2SD291
D101~D103 (D201~D203)		Diode 1S1555
D131(D231)		Diode SV-31
D132(D232)		Diode VD-1221
D133(D233)		Diode SH-1S
D134(D234)		Diode SH-1S
D135(D235)		Diode 1S1555
D136(D236)		Diode SH-1S
D137(D237)		Diode VD-1221
D138(D238)		Diode SV-31
D139(D239)		Diode VD-1221
D140(D240)		Diode SH-1S
D141(D241)		Diode SH-1S
D142(D242)		Diode 1S1555
D181~D184 (D281~D284)		Diode 1T22A
D301		Diode 1T243M
D302		Diode VD-1221
D303~D310		Diode 1T243M
D311		Diode 1T22A
D312		Diode VD-1221
D331		Diode S5151
D332		Diode 10D-2
D333		Diode 1T243M
D334		Diode S5151R
D335		Diode 10D-2
D336		Diode 10D-2
D337		----------
D338		Diode 5P2M
D339		Diode 5P2M
D340~D343		Diode UO-5E
D344		Diode VD-1221

Ref. No.	Part No.	Description
D401~D404		Diode 10D-2
D405		Diode 1T243M
D406		Diode 1S1555
Pth301, Pth302	1-800-340-00	Posistor

CAPACITORS

Capacitors listed here are electrolytic type unless otherwise specified and in μF except as indicated with p (p means μμ).

C101(C201)	1-102-973-11	100p	50V	ceramic
C102(C202)	1-102-947-11	10p	50V	ceramic
C131(C231)	1-121-352-11	47	10V	
C132(C232)	1-121-352-11	47	10V	
C133(C233)	1-121-419-11	220	6.3V	
C134(C234)	1-108-657-12	0.01	100V	mylar
C135(C235)	1-121-352-11	47	10V	
C136(C236)	1-108-843-12	0.033	50V	mylar
C137(C237)	1-108-657-12	0.01	100V	mylar
C138(C238)	1-121-396-11	4.7	50V	
C181(C281)	1-121-990-11	22	16V	
C182(C282)	1-105-677-12	0.22	50V	mylar
C183(C283)	1-105-677-12	0.22	50V	mylar
C301	1-121-395-11	4.7	25V	
C302	1-121-409-11	47	25V	
C303	1-108-657-12	0.01	100V	mylar
C304	1-121-396-11	4.7	50V	
C305	1-121-352-11	47	10V	
C306	1-121-396-11	4.7	50V	
C331	1-102-355-11	0.01 (2 pieces)	500V	ceramic
C332/C333	1-123-144-11	10000	70V	electrolytic (block type)
C334	1-102-355-11	0.01 (2 pieces)	500V	ceramic
C335	1-105-757-12	0.022	200V	mylar
C336	1-105-757-12	0.022	200V	mylar
C337	1-121-990-11	22	16V	
C338	1-121-990-11	22	16V	
C401	1-121-245-11	1000	16V	

Ref. No.	Part No.	Description

RESISTORS

All resistors are in Ω. ¼W, ±5% carbon resistors (except particular type) are omitted.
Check schematic diagram for the resistance values.
k = 1000, M = 1000 k.

R109(R209)	1-211-913-11	1k	±1%	carbon
R117(R217)	1-210-509-11	33k	±1%	carbon
R141(R241)	1-209-144-21	4.7	1W	carbon
R143~R145 (R243~R245)	1-217-158-11	0.47	5W	metal
R156(R256)	1-209-144-21	4.7	1W	carbon
R158~R160 (R258~R260)	1-217-158-11	0.47	5W	metal
R165(R265)	1-209-148-21	10	1W	carbon
R181(R281)	1-206-640-11	100	2W	metal-oxide
R182(R282)	1-206-648-11	220	2W	metal-oxide
R183(R283)	1-206-644-11	150	2W	metal-oxide
R316	1-210-509-11	33k	±1%	carbon
R331	1-206-099-11	3.3k	1W	metal-oxide
R341(R342)	1-206-128-11	820	2W	metal-oxide
RT101(RT201)	1-224-550-00	220, adjustable		
RT102(RT202)	1-224-490-00	4.7 k, adjustable		
RT181(RT281)	1-224-250-00	2.2k, adjustable		
RT301	1-224-251-00	4.7k, adjustable		
RT331	1-224-488-00	470, adjustable		
RT401	1-224-489-00	2.2k, adjustable		
RV101(RV201)	1-224-481-00	100k (B), variable (INPUT LEVEL)		
RV102(RV202)	1-224-484-00	100k (B), variable (SPEAKER LEVEL)		

SWITCHES

S1,S2	1-516-081-00	Slide (NORMAL/TEST)
S3	1-516-583-00	Pushbutton, 2-key (FUNCTION)
S4	1-516-584-00	Pushbutton, 2-key (METER SENSITIVITY)
S5	1-516-586-00	Rotary (SPEAKER)

Ref. No.	Part No.	Description
S6	1-516-580-00	Slide (MODE)
S7~S9	1-516-582-00	Pushbutton, 4-key (POWER LIMITER)
S10	1-516-585-00	Pushbutton (POWER)

MISCELLANEOUS

CNJ301	1-509-403-00	Outlet, ac
CNP301	1-534-992-00	Cord, power
CP301	1-231-057-00	Encapsulated Component, 0.033 μF + 120 Ω
F301,F302	1-532-227-00	Fuse, 6.3A
J101(J201) J102(J202)	1-536-352-00	Jack, phono; 4-P
L131(L231) L132(L232)	1-407-592-00	Microinductor, 1.8 μH
L331	1-421-243-00	Coil, choke
PL301	1-518-158-00	Lamp, POWER
PT301	1-442-327-00	Transformer, power
TM301~ TM303	1-535-090-00	Terminal Strip (SPEAKER)
VS301	1-526-520-11	Selector, voltage
	1-508-649-00	Connector, 10-P (male)
	1-508-650-00	Connector, 6-P (male)
	1-508-652-00	Connector, 8-P (male)
	1-508-692-00	Connector, 6-P (male)
	1-508-694-00	Connector, 8-P (male)
	1-509-667-00	Socket, transistor
	1-520-186-21	Meter, PEAK PROGRAM
	1-533-100-00	Holder, fuse
	1-536-354-00	Pin, terminal

CARTON AND ACCESSORIES

X-3701-029-0	Card Ass'y, warranty
X-4490-002-0	Cloth Ass'y, polishing
1-506-138-11	Plug, phono (red)
1-506-138-12	Plug, phono (white)
3-701-020-00	Bag, polyethylene; instruction manual
3-701-300-00	Bag, polyethylene; unit
3-701-730-00	Bag, polyethylene; IBM card
3-701-742-00	Card, IBM
3-780-427-21	Manual, instruction
3-793-765-21	Sheet, check
4-836-256-00	Carton
4-836-257-00	Cushion, side
4-836-258-00	Cushion, lower
4-836-259-00	Cushion